

## Comparison of BD CBA Standards to the NIBSC/WHO International Standards

The NIBSC protein standards are recognized by the World Health Organization (WHO) as international biological standards. They meet established requirements for accuracy, consistency, and stability. The NIBSC/WHO standards are assigned potency values in International Units (IU) of biological activity and nominal mass (ie, not absolute mass values). Therefore they cannot be used to establish absolute concentrations for a cytokine preparation.

However, these standards do provide a means to facilitate comparisons of cytokine concentration values determined by experiments conducted within different laboratories or methods. The source of a recombinant protein (ie, insect cell, E. coli, etc.) and the affinity of antibodies used can affect the measurement and performance of a protein in an immunoassay. The conversion factors provided in the following table make it possible to compare protein concentrations in samples measured by different immunoassays that have been standardized to the same NIBSC/WHO standards.

The conversion factor may change based on the batch of either standard. Therefore, the conversion factor is intended to be a guideline indicating whether a BD CBA assay over- or underestimates analyte concentrations relative to the NIBSC/WHO standards. Researchers are advised to incorporate both sets of standards in their assays if they wish to derive data from the NIBSC/WHO standards.

### NIBSC conversion factor summary for BD CBA Kit Standards

	NIBSC STANDARD			CALCULATED CONCENTRATION USING BD CBA KIT (pg/mL)	NOMINAL NIBSC CONCENTRATION (pg/mL)	BD CBA KIT: NIBSC/WHO MASS CONVERSION FACTOR
	CODE NO.	MASS UNITS / VIAL	IU VALUE			
Human IFN- $\gamma$	87-586	12.5 ng	250	4,495.12 $\pm$ 657.67	5,000	1.12
Human IL-1 $\beta$	86-680	1 $\mu$ g	100,000	3,463.92 $\pm$ 184.87	5,000	1.46
Human IL-2	86-504	7.6 ng	100	3,118.99 $\pm$ 449.33	5,000	1.61
Human IL-4	88-656	100 ng	1,000	5,717.84 $\pm$ 632.51	5,000	0.88
Human IL-5	90-586	500 ng	5,000	3,892.01 $\pm$ 501.66	5,000	1.30
Human IL-6	89-548	1 $\mu$ g	100,000	4,986.28 $\pm$ 633.36	5,000	1.01
Human IL-8	89-520	1 $\mu$ g	1,000	3,359.12 $\pm$ 319.33	2,500	0.74
Human IL-10	93-722	1 $\mu$ g	5,000	4,389.72 $\pm$ 469.84	5,000	1.14
Human IL-12p70	95-544	1 $\mu$ g	10,000	3,764.63 $\pm$ 276.73	5,000	1.34
Human MCP-1	92-794	5 $\mu$ g	5,000 arbitrary units	2,653.49 $\pm$ 159.89	2,500	0.95
Human RANTES	92-520	10 $\mu$ g	100,000 arbitrary units	1,116.63 $\pm$ 90.04	2,500	2.26
Human TNF	88-786	1 $\mu$ g	46,500	3,651.85 $\pm$ 417.15	5,000	1.38
Mouse IL-2	93-566	100 ng	10,000 arbitrary units	627.37 $\pm$ 26.29	5,000	8.03
Mouse IL-4	91-656	1 $\mu$ g	10,000 arbitrary units	867.48 $\pm$ 59.91	5,000	5.81
Mouse IL-6	93-730	100 ng	10,000 arbitrary units	486.43 $\pm$ 52.42	5,000	10.26
Mouse TNF	88-532	1 $\mu$ g	200,000 arbitrary units	2,328.01 $\pm$ 140.83	5,000	2.17